United States Department of the Interior

FISH AND WILDLIFE SERVICE
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JUL 2 8 2005

Colonel Garry F. Atkins
Department of the Army
Headquarters, U.S. Army Garrison Fort Sam Houston
2108 9th Street
Fort Sam Houston, Texas 78234-5014

Consultation # 2-15-2002-F-0315

Dear Colonel Atkins:

Enclosed is the final Programmatic Biological Opinion for the proposed implementation of the *Military Mission and Associated Land Management Practices and Endangered Species Management Plan* (ESMP) *for the U.S. Army's Camp Bullis in Bexar County, Texas.*

Your assistance in completing this consultation has been greatly appreciated. If you have any questions regarding this Programmatic Biological Opinion, please contact Allison Arnold at 512-490-0057, extension 242.

Sincerely,

Robert T. Pine
Supervisor

cc: Jackie R. Schlatter, Camp Bullis, San Antonio, TX

Enclosure

TAKE PRIDE IN AMERICA

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Dear Colonel Atkins:

This transmits our programmatic opinion pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.)* for projects with effects on the Federally endangered golden-cheeked warbler (*Dendroica chrysoparia*)(warbler), black-capped vireo (*Vireo atricapilla)* (vireo), Madla's cave meshweaver (*Cicurina madla*), and two unnamed beetles, *Rhadine infernalis* and *Rhadine exilis*, and their habitats. Together, the Madla's cave meshweaver and the two beetles will be referred to as endangered cave species (ECS). "Projects" are those pursuant to the implementation of the *Military Mission and Associated Land Management Practices and Endangered Species Management Plan* (ESMP*) for the U.S. Army's Camp Bullis* (Camp Bullis or Installation*) in Bexar County, Texas* (proposed project). Camp Bullis projects that meet the conditions specified below, or that the U.S. Fish and Wildlife Service (Service) determines will have similar effects, may be appended to this programmatic opinion. The geographic scope of this consultation includes lands within the jurisdictional boundaries of Camp Bullis, Bexar County, Texas.

The purpose of this programmatic opinion is to expedite Camp Bullis projects with relatively minor effects on the Federally listed species and their habitat. Projects that exceed the programmatic threshold will require individual biological opinions. The Service will re-evaluate this programmatic opinion annually to ensure that its continued application will not result in unacceptable effects on Federally listed species or their habitat. Restrictions based on incidental take for avian species are as follows:

Table 1. Extent of take for listed species per year.

Species	Permanent Effects	Temporary Effects
Golden-cheeked warbler	No more than 1.00 acre (0.40 hectares) per year	No more than 4.00 acres (1.62 hectares) per year
Black-capped vireo	No more than 0.5 acre (0.20 hectares) per year	No more than 0.5 acre (0.20 hectares) per year

Restricting this programmatic opinion to projects with temporary and permanent effects as prescribed above will limit the effects of the programmatic actions on the federally listed species and their habitat. Tracking and restricting project effects over time will serve to minimize cumulative effects at local and regional levels.

The findings and recommendations in this consultation are based on: (1) various emails, meetings, and telephone conversations between Camp Bullis staff and the Service from 2001 through June 2005; (2) a letter from Camp Bullis dated July 23, 2004, to the Service requesting consultation; (3) the *Biological Assessment of the Military Mission and Associated Land Management Practices and the Proposed Endangered Species Management Plan for Camp Bullis, Texas FY 05-09* (ESMP); (4) the December 27, 2001, *Integrated Natural Resources Management Plan* (INRMP) dated 2001; (5) the *Environmental Assessment for the Overall Mission at Camp Bullis Military Reservation, Texas*; (6) the *Hydrogeological, Biological, Paleontological, and Archeological Karst Investigations, Camp Bullis, Texas 2003-2004* prepared September 3, 2004, by George Veni & Associates; (7) the December 19, 2002, *Management Plan for the Conservation of Rare and Endangered Karst Species, Camp Bullis, Bexar and Comal Counties, Texas* (Karst Management Plan) prepared by George Veni, et al.; (8) the *Memorandum of Understanding Between the U.S. Army, Fort Sam Houston, Texas, and the U.S. Fish and Wildlife Service* dated December 20, 2002, (MOU); and, (9) other sources of information available to the Service. A complete administrative record of this consultation is on file at this office.

Consultation History

October 29, 2001: Preliminary meeting between the Service, Camp Bullis, the U.S. Army Corps of Engineers – Fort Worth District, and Gulf South Resources Corporation to discuss biological and ecological components of the ESMP.

September 12, 2002: Meeting between the Service and Camp Bullis to discuss the history of various consultations and the need for a comprehensive ESMP to cover activities that may effect federally listed species.

May 20, 2003: Representatives from the Service and Camp Bullis conducted surveys for warblers at several sites where no warblers had been found in at least three years of surveys.

July 3, 2003: Meeting between the Service and Camp Bullis to discuss the ESMP. Specifically, items discussed include definition and delineation of core and non-core habitat, training restrictions in habitat, conservation measures, and quantification of take.

August 28, 2003: Representatives from the Service and Camp Bullis toured the base and discussed management alternatives.

July 23, 2004: A letter dated July 23, 2004, from the U.S. Army, Garrison Fort Sam Houston, to the Service requesting formal consultation.

April 7, 2005: A site visit attended by Allison Arnold, Jana Milliken, and Jenny Wilson of the Service and Jackie Schlatter and Lucas Cooksey of Camp Bullis.

April 12, 2005: An email from Jackie Schlatter of Camp Bullis to Allison Arnold of the Service relaying information requested at the April 7, 2005, site visit.

Definitions

Habitat. For the purposes of this programmatic opinion, habitat for each species will be defined as all habitat for warblers, vireos, and ECS that occurs within the jurisdictional boundaries of Camp Bullis. "Core" golden-cheeked warbler habitat is habitat where golden-cheeked warblers have been located at least once within the last three consecutive years.

Disturbance Area. Primary disturbance acreage will be determined by project area; however, disturbance area may exceed project boundaries because a 300 foot (100 meter) buffer from the edge of habitat is incorporated to include essential habitat components and determine potential take. Disturbance may be temporary and/or permanent and should consider: (1) opportunities to avoid habitat within the project area; (2) area, timing, and duration of the disturbance; and (3) temporary haul roads and equipment staging areas.

Temporary Effects. Temporary effects are project activities that temporarily remove essential habitat components, but can be restored to pre-project conditions of equal or greater habitat values. Projects that are to be considered temporary effects must be able to implement the project and restore the affected habitat within two seasons.

Permanent Effects. Permanent effects are those project activities that result in loss of habitat and/or permanently remove essential habitat components. Temporary projects that exceed two seasons to complete will be considered permanent effects.

Season. A season is defined as the period between August 15th and February 28th, when warblers and vireos are typically absent from Texas. Project effects and restoration of habitat that can be completed within this period or, if necessary, within the same calendar year with an approved extension, will be considered occurring within one season.

Monitoring. The following level of monitoring is required when specified: (1) photo documentation included in a report notifying the Service when the habitat restoration was completed and what materials were used; (2) photo documentation and progress report submitted one year from restoration implementation; (3) justification from release of any further

monitoring, if requested; and, (4) recommendations for remedial actions and request for approval from the Service, if necessary.

Programmatic Opinion Guidelines

Initial project authorization under this programmatic opinion is dependent upon the following criteria:

1. Effects will not exceed permanent or temporary losses of habitat prescribed in Table 1 of this programmatic opinion; and,

2. The Scope of Work is one or more of the types listed on pages 5-11 of this programmatic opinion and routinely authorized by Camp Bullis, as appropriate.

Implementing Procedure

The following process will be used when implementing future proposed projects under this programmatic opinion:

1. Camp Bullis will submit a letter requesting that the proposed project be appended to this programmatic opinion and a brief environmental assessment;

2. The Service will review the proposed project to determine if the project is: (1) not likely to adversely affect listed species; (2) is appropriate to append to this programmatic opinion; or (3) requires a separate biological opinion; and,

3. Upon appending a proposed project to this programmatic opinion, the Service will, in consultation with Camp Bullis biological staff, determine whether one or a combination of the following is required: (1) restoration of the project site and, (2) monitoring to ensure success of restoration implemented.

BIOLOGICAL OPINION

Description of the Proposed Action

Camp Bullis Training Site, located at the northern edge of the San Antonio metropolitan area, is a sub-installation of Fort Sam Houston, Texas. Camp Bullis provides military training facilities for use by all branches of the U.S. Armed Forces. The primary use is by active duty units of both the U.S. Army and U.S. Air Force. Most notably, Camp Bullis is the field training site for approximately 32 courses conducted by the U.S. Army Medical Department Center and School (AMEDDC&S) and the U.S. Air Force Ground Combat Skills School. Camp Bullis also has a tenant Texas Army National Guard mechanized infantry battalion headquarters with one company of mechanized infantry and several U.S. Army Reserve intelligence and engineer units. Camp Bullis provides firing range and training area support for numerous civilian and federal

law enforcement agencies. Army Regulation 200-3, Natural Resources-Land, Forest and Wildlife Management (AR 200-3), Chapter 11, requires installations to develop an ESMP, which assesses potential effects of military training and land management activities on federally listed species, and to determine whether those effects are likely to be adverse. The proposed action is the implementation of the ESMP for Camp Bullis.

Proposed activities include military training and facilities use that are anticipated to continue for the next ten years and are necessary to accomplish routine mission requirements. Annually, this programmatic opinion will be re-evaluated to determine effects of this consultation on federally listed species.

Activities include: maneuver training, aviation training, live fire training, recreation, brush management, prescribed burning, surveying, monitoring, and operation and maintenance of the Installation. Each is described below.

1. Maneuver Training

Maneuver areas at Camp Bullis encompass 21,378 acres (ac) (8,631 hectares) (ha), approximately 76 percent of the Installation. These areas are divided into 11 main maneuver areas (MAs) to allow for easier coordination and scheduling of training activities on the Installation. Training facilities on Camp Bullis are shown in Figure 1. MA 9 is the Impact Area described below. MA 6A and 6B contain training parks for the AMEDDC&S.

The maneuver areas of Camp Bullis are used to accomplish a variety of military training objectives, several of which require large expanses of land for realistic training. Field training includes movement to contact, patrolling, defensive positions, search and rescue, terrain analysis, escape and evasion, survival, recon in enemy territory, and mechanized infantry training using the Bradley Fighting Vehicle (an armored personnel carrier). Within the maneuver areas are training facilities identified as Training Areas. Training Areas include land navigation courses, obstacle courses, driver training courses, hardened bivouac sites, a litter obstacle course, drop zones, a Basic Combat Convoy Course, a Basic Combat Convoy Course with Lifesaving, two Military Operation in Urban Terrain facilities to teach urban warfare tactics, two simulated airfields for the Air Force Ground Combat Skills training, and an actual 3,500 foot (1,067 meter) compacted earth Combat Assault Landing Strip for Joint Training Exercises with the Army and Air Force.

The following sections disclose major users or tenant unit activities that may occur in proximity to, and may effect populations and habitats of listed species.

<u>Army Medical Department Center and School</u>

This facility covers 2,135 ac (862 ha) in MA 6. This facility provides classroom facilities and field training areas for U.S. Army and other military service medical personnel. Up to 36,000 personnel may train at this facility annually. Training activities associated with this facility

include classroom and field training exercises. Field training includes wheeled and tracked vehicle transit, helicopter flight, generator use during night training exercises, and perimeter lighting. Most training is accomplished in training parks. These training parks minimize damage to plants, soils, or other natural resources by using hardened facilities such as graveled areas for repetitive vehicle or personnel use.

343rd Training Squadron (TRS), Detachment 1 (Ground Combat Skills)

The 343rd TRS provides classroom and field training exercises for students in air base protection. Average daily student load is 272 personnel. Approximately 80 percent of training time is spent in the field and includes live weapons firing and field training exercises.

Field training exercises are primarily dismounted (on foot) training with vehicle transport to, and from, training locations. Activities include map and compass land navigation exercises, field communications, patrolling, tactical training, and air base defense simulations. Field training is conducted in MAs 1, 2B, 4A, 4B, 5A, 5D, 6A, 6B, 7, 8, and 11B.

National Guard: 1st Battalion (Mechanized) 141st Infantry Regiment

The 1st Battalion (Mechanized) 141st Infantry Regiment is the on-site Texas National Guard component at Camp Bullis. Approximately 760 personnel per month conduct training primarily on weekends, nine months per year.

Field training activities include platoon and company level tactical training, weapons training, and land navigation for dismounted infantry.

The total deployed force on Camp Bullis is two companies of 14 Bradley fighting vehicles each with support from four to five M113 tracked ambulance support vehicles. Bradley fighting vehicles are the Army's primary armored, tracked personnel carrier. Tactical field exercises typically involve three to four armored vehicles at any one time, training four times per year.

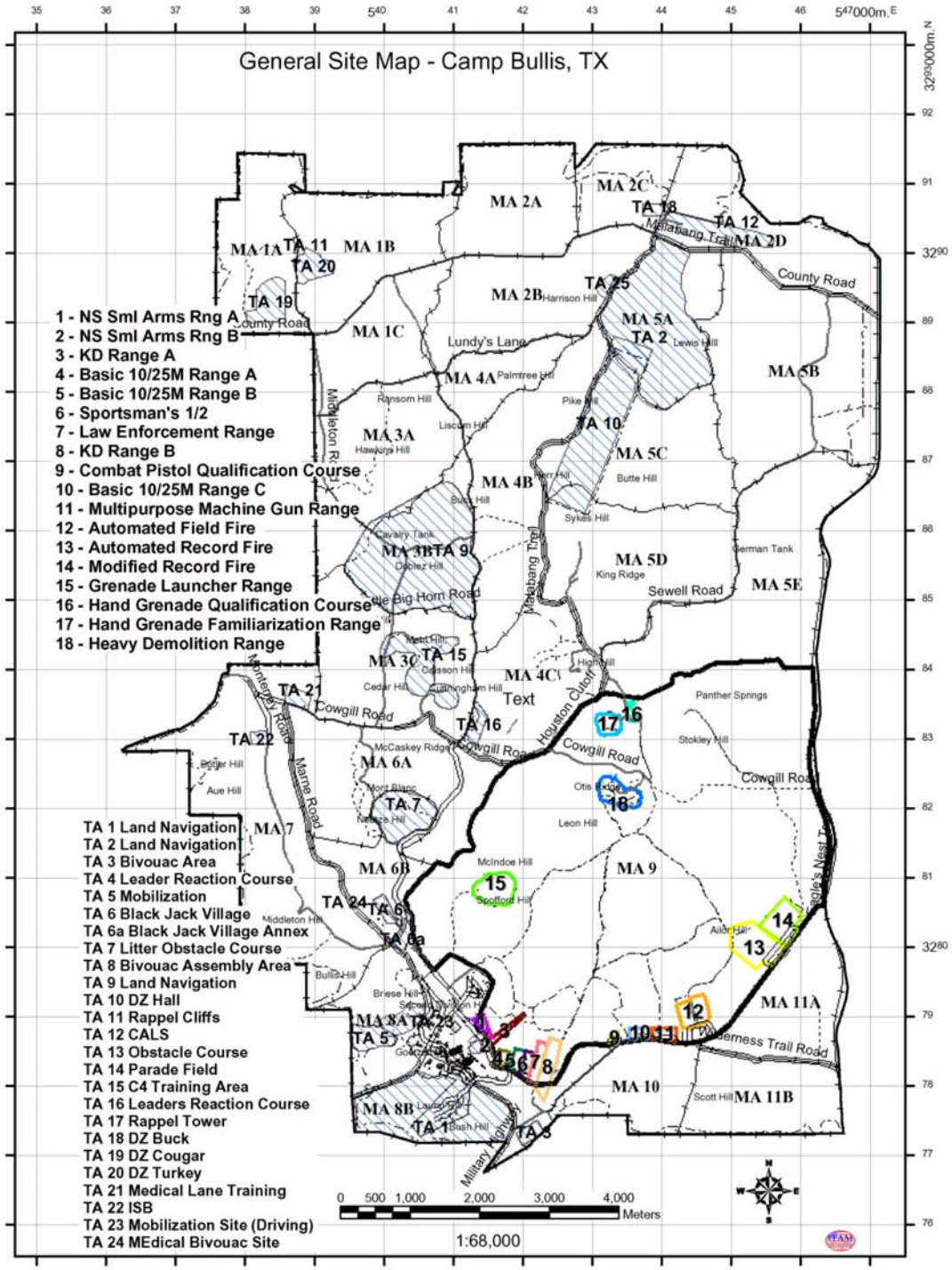
Training of armored units is accomplished in portions of MAs 1 though 5. These areas offer the terrain and open space needed for effective maneuvering of Bradley Fighting Vehicles.

2. Aviation Training

Aviation training at Camp Bullis involves the use of fixed-wing and rotary-wing aircraft. Primary fixed-wing aircraft used is the C-130 cargo carrier. The primary rotary-wing aircraft used is the UH-60 Blackhawk. Other helicopters occasionally used include the UH-1 Iroquois, OH-58 Kiowa, AH-1 Cobra, and the AH-64 Apache.

Aviation training at Camp Bullis is used to gain proficiency in a number of air operations including medical evacuation by helicopter air ambulance, aerial recon, and Nap of the Earth flight training where helicopters practice low-level flying using valleys and hills to hide from visual observation,

Figure 1. General Site Map, Camp Bullis, Texas



radar, and hostile fire. The Combat Assault Landing Strip, a 3,500 foot compacted earth runway for C-130 aircraft, is used by both the Army and Air Force during Joint Training Exercises. Approximately 20 fixed-wing missions per year and three rotary-wing missions per week are currently flown at Camp Bullis.

Drop zones on the Installation include DZ Hall (MA 5), DZ Buck (MA 2C), DZ Turkey (DZ 1B), and DZ Cougar (MA 1A). DZ Hall is the largest of the drop zones at 400 ac (161 ha) and 2,700 yards (2,468 meters) long. Personnel and equipment drops are approved for DZ Hall. DZs Turkey and Buck are approved for equipment drops only. DZ Cougar is approved only for equipment drops by rotary wing aircraft.

3. Live Fire Training

There are 18 ranges located to the north and east of the cantonment area. These ranges are arranged in a crescent generally along the south, east, and north sides of the impact area. Weapons fire from these ranges is directed toward the center of the impact area. These ranges provide known distance, qualification, and demonstration training for a variety of weapons including pistol, shotgun, M16 rifle, M60 machine gun, live grenade, claymore mine, M79 and M203 grenade launcher, and Light Anti-Tank Weapon. On average, three ranges per day are utilized with an average of 500,000 rounds per year shot downrange.

The impact area (MA 9) for the firing ranges at Camp Bullis is located in the southeastern portion of the camp. It is bounded on the north by MA 5, on the east by Blanco Road, on the south and southeast by MA 10 and MA 11A, and on the west by MA 6. The area is 6,011 ac (2,432 ha).

An Explosive Ordnance Demolition (EOD) range is located in the northern portion of MA 9. Use of this range is controlled by the commander of the 797th EOD Detachment. This range is the only one of its kind with an EOD operation permit in a 63-county area. The 797th is required by Federal mandate to support any law enforcement agency that does not have an ordnance disposal team. The 797th is the only group permitted to use the range, though they also hold or monitor training sessions for other agencies or units. Detonations at the site are currently limited to 100 pounds at any one time; however, most detonations currently are 50 pounds or less. The maximum yield that the EOD range is allowed to detonate in a single event is 200 pounds, though this would require a special "request for exception to policy" to be submitted to the Fort Sam Houston installation commander.

4. Non-military Land Uses

<u>Other Government Agencies</u>

Federal and local law enforcement agencies utilize Camp Bullis training areas and range facilities for arms qualification and proficiency firing. The San Antonio Police Department conducts Special Weapons and Tactical training at Camp Bullis. The Federal Aviation Administration

operates two remote VHF/UHF Air to Ground Communication stations and remote transmitter stations on High Hill and Hill No. 1479 at Camp Bullis for the purpose of air traffic control. The U.S. Geological Survey operates two water quality monitors on Camp Bullis as part of the National Water-Quality Assessment Program. The Texas Council on Environmental Quality (TCEQ) operates a Continuous Air Monitor Sampler at Camp Bullis, which is one of a group of air monitors in the San Antonio area to determine compliance with Environmental Protection Agency air quality standards for the city. The San Antonio River Authority operates three flood control dams located on Camp Bullis as a part of the Upper Salado Creek Flood Control Project. The National Cave Rescue Commission operates an annual training seminar using Installation caves.

Recreation

Recreational facilities available for use by training units at Camp Bullis include a softball field, soccer field, volleyball court, and picnic area. Camping is allowed on the Installation but is limited and strictly controlled.

Approximately 21,000 ac (8,478 ha) are open for hunting each year during the state regulated seasons. Hunting is allowed with a Camp Bullis Sportsman's Card and a state hunting license. The commander of Camp Bullis regulates access. Common game animals include the white-tailed deer (*Odocoileus virginianus*), axis deer (*Axis axis*), eastern cottontail rabbit (*Sylvilagus floridanus*), fox squirrel (*Sciurus niger*), turkey (*Meleagris gallopavo intermedia*), and the mourning dove (*Zenaida macroura*).

The Boy Scouts of America utilize the MAs and an area adjacent to the cantonment area for mountaineering and land navigation training and camping.

Grazing

Outgrant leases for cattle grazing began in the early 1960s and continued through 1992. The grazing outgrant program was terminated in favor of prescribed burning for brush management. There has been no grazing since 1992.

Wildfire

Wildfires occur on Camp Bullis in most years. Since 1995, wildfires have burned approximately 1,000 ac (404 ha) for an average of 125 ac (58 ha) per year. These fires were usually associated with the range impact area and caused by tracer ammunition and pyrotechnics. While some areas tend to burn annually, most burn only after fuel has increased sufficiently to carry a fire (every ten to thirty years). Repeated fires occurring at this rate tend to keep succession at an early stage that promotes habitat conditions conducive for the black-capped vireo.

Current policy on Camp Bullis is to allow fires in the impact area to burn if there are currently no unsafe weather conditions forecast, if the fire is contained within roads or firebreaks and if they pose no threat to military or civilian structures, wildlife habitat or public safety. Additionally,

areas that are steep terrain, where more damage would occur to the plant communities and soils by the fire fighting equipment, are generally allowed to burn.

Ongoing Scientific Studies

Currently, monitoring and surveys of vireos and warblers are conducted annually on Camp Bullis. Monitoring of the vireo was initiated in 1989 and for the warbler in 1990. These monitoring efforts consist of point count surveys for the warbler and presence/absence surveys for the vireo. Additional presence/absence surveys for the warbler are conducted in areas slated for vegetation disturbing activities such as brush management and construction projects to ensure that the species are not present in the project area. In recent years, efforts to monitor specific territories of both of these birds has begun.

Surveys and biological collections in cave and karst features on Camp Bullis have been conducted annually since 1994. These activities consist of regular collections of both vertebrates and invertebrates from each cave of interest. Specimens collected are identified to genus and, where possible, to species. Identifications provide lists of species known to occur in each cave studied and determine which caves have species of particular concern. This information is used to make management decisions concerning protection of caves on Camp Bullis.

In addition to the above, Camp Bullis, together with Texas A&M University, the Edwards Aquifer Authority, the San Antonio Water System, the University of Minnesota, George Veni and Associates, and Duke University, have begun to implement a feasibility study on augmenting groundwater recharge through Ashe juniper (*Juniperus ashei*) control on Camp Bullis. This study will concentrate on two or three caves on Camp Bullis – Headquarters Cave, Bunnyhole Cave, and/or B-52 cave; two of which, Headquarters Cave and Bunnyhole Cave, are in warbler habitat. Water seepage into the caves will be monitored and a rainfall simulator will allow control of the timing and amount of water. A tracer, added to the water, will be applied to a well-instrumented site that is above a cave. The surface instrumentation would quantify rainfall rates, surface runoff, interflow runoff, stem flow, throughfall and canopy interception for both natural and simulated rainfall events. The cave monitoring would provide a direct measurement of recharge for both natural and simulated rainfall events and allow researchers to complete the water budget. After a solid relationship between the seepage rate and precipitation has been established, researchers will remove the overlying juniper cover and determine the extent to which seepage rates change. Approximately one ac (0.40 ha) of warbler habitat will be cleared.

Installation Operation and Maintenance (O&M)

Operation and maintenance of the Installation often requires removal of vegetation from roads and trails, training and maneuver areas, and in areas where specific projects will occur. All maintenance that will require removal of trees is coordinated through the Environmental and Integrated Training Area Management (ITAM) Office before work begins. Tree removal occurs only when absolutely necessary for continued use of the area. Tree removal is usually confined

to re-growth juniper of less than 12 feet (3.66 meters) in height and tree trimming is restricted to branches below six feet. Where removal of a tree greater than 12 feet (3.66 meters) is necessary, all attempts are made to leave the upper tree canopy intact. Road clearing in warbler or vireo habitat is restricted to eight feet (2.4 meters) on each side of the road. All work in habitat is further restricted to outside the breeding season.

In addition to regular maintenance, site-specific projects may affect vegetation resources. As with maintenance activities, all work is coordinated through the Environmental and ITAM Office before work begins. All efforts are made to restrict project work to the same standards as maintenance work.

5. Current Natural Resource Management Practices

Brush Management

Brush management activities are conducted primarily under the Tactical Concealment Area (TCA) program administered by the Environmental and ITAM Office at Camp Bullis. The concept of TCA was developed during the early 1980s at the U.S. Army Construction Engineering Research Laboratories as guidance for enhancement and/or rehabilitation of deteriorated training lands. In 1996, Camp Bullis was given the opportunity to participate in the development of this guidance document, which has been distributed to Army installations worldwide. This guidance ensures that appropriate consideration is made of an installation's training needs, existing resources and conditions, and environmental concerns in planning, designing, and maintaining realistic training areas. Camp Bullis served as one of four demonstration areas across the United States for this work.

The objective of brush management is to increase training opportunities and improve habitat for woodland, edge, grassland, and savanna species. This objective is realized through selective removal of juniper and other brush, and is limited to flat or gently sloping watershed divides and wide stream valleys. The decision to remove brush from any given area is a well thought out process that considers historic photographs and references, cultural and natural resource needs, and the goals of the training community on Camp Bullis.

Juniper and mixed brush are kept on steep slopes and in canyons, where it is a component of warbler habitat, protects a resource from vehicular traffic, or supplements wildlife management and the implementation of the TCA program. In addition, stands that complement the goals of Camp Bullis by providing buffers along the perimeter, improve the reality of training, and have the potential to evolve into warbler habitat, are also retained.

Prescribed Burning

Prescribed burning has been used as a management tool for maintaining grassland savannas at Camp Bullis since the mid-1970s. Burns since that time have totaled about 10,000 ac (4,037 ha). Juniper is a fire sensitive species with young plants up to approximately 4.9 feet (1.5 meters) in

height that are easily killed by fire under cool burn conditions. Hardwood species within grassland areas tend to be fire resistant, and are seldom harmed as long as a high fuel load does not exist in proximity. Areas that have been subjected to repeated burns have developed into a mosaic of grassland and mixed brush, including juniper, depending on terrain and soil condition. Deeper soils within burn areas tend to remain in a grassland configuration, while shallower soils that produce a lesser amount of fine fuel (grass) gradually are occupied by scattered woody species. The plant community mosaic resulting from prescribed burns provides wildlife food and cover and open military maneuver space and tactical concealment opportunities.

From 1989-1991, no prescribed burns were used due to a shortage of manpower. From 1991 to 1994, a total of approximately 2,698 ac (1,089 ha) were managed with prescribed burning. Since 1999, between 150 – 500 ac (60.7 – 202 ha) per year have been managed with prescribed burns.

Proposed Conservation Measures

Chapter 4 of the ESMP and the appropriate provisions of the Karst Management Plan detail: (1) specific objectives for endangered species; (2) justification of objectives based on the best scientific and commercial data available; and, (3) specific actions necessary to achieve those objectives. Camp Bullis proposes to implement specific objectives in order to conserve and protect listed species and their associated habitat within their jurisdictional boundaries.

Implementing the ESMP likely will subject limited areas of warbler and vireo habitat to greater disturbance from transient training likely resulting in incidental take. However, the ESMP provides provisions to offset these likely effects. Effects are limited to within parameters currently believed necessary to maintain populations of both warblers and vireos on Camp Bullis and are consistent with Service recovery goals for these species.

Fully implemented, the ESMP is anticipated to meet conservation objectives for listed species, assist in species recovery, fulfill section 7(a)(1) and or 7(a)(2) Act requirements, reduce threats for species that could be future candidates for listing, and be compatible with the accomplishment of military mission-essential tasks.

The principal objectives of actions prescribed in the proposed ESMP for listed species as described in section 7 of the ESMP, "Actions to Avoid or Offset Potential Adverse Effects," and will be implemented to:

- Maintain sufficient habitat and sustain populations to meet or exceed current Service recovery goals for these species for the vireo and warbler;

- Minimize incidental take of the vireo and warbler by minimizing habitat destruction and disturbance;

- Conserve and protect listed karst species and other cave-adapted species of concern and their habitat in perpetuity, within the limits possible through the caves, land, and authority of Camp Bullis and its operational and mission requirements;

- Ensure the karst species' survival, genetic diversity, and evolution in a manner consistent with the delisting or downlisting of endangered and threatened karst species as recognized by the Service (1994) recovery plan for related listed species in the Austin, Texas area; and,

- Provide necessary flexibility to achieve mission essential objectives.

Status of the species

Golden-cheeked warbler

Species Description and Life History

The golden-cheeked warbler was emergency listed as endangered on May 4, 1990, (55 FR 18844). The final rule listing the species was published on December 27, 1990, (55 FR 53160). No critical habitat is designated for this species.

The warbler is a small, insectivorous songbird, 4.5 to 5 inches (11.4 to 12.6 centimeters) long with a wingspan of approximately eight inches. Average breeding weight is 0.36 ounces (10.2 grams) for adult males and 0.33 ounces (9.4 grams) for adult females. Wings are black with two distinct white wing-bars. Males have a black back, throat, and cap, and yellow cheeks with a black eye strip. Females are similar, but duller overall in color (Service 1992).

Warblers breed exclusively in the mixed Ashe juniper/deciduous woodlands of the central Texas Hill Country west and north of the Balcones Fault. Warblers require the shredding bark produced by mature Ashe junipers for nest material. Typical deciduous woody species include Texas oak (*Quercus buckleyi*), Lacey oak (*Quercus glaucoides*), live oak (*Quercus fusiformis*), Texas ash (*Frazinus texensis*), cedar elm (*Ulmus crassifolia*), hackberry (*Celtis occidentalis*), bigtooth maple (*Acer grandidentatum*), sycamore (*Platanus occidentalis*), Arizona walnut (*Juglans major*), and pecan (*Carya illinoinensis*).

Breeding and nesting warblers feed primarily on prey items including insects, spiders, and other arthopods found in Ashe junipers and associated deciduous tree species (Pulich 1976).

Male warblers arrive in central Texas around March 1st and begin to establish breeding territories, which they defend against other males by singing from visible perches within their territories. Females arrive a few days later, but are more difficult to detect in the dense woodland habitat. Three to five eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June. By early August, the warblers begin their migration south. Warblers winter in the highland pine-oak woodlands of southern Mexico and northern Central America.

Historic and Current Distribution

The warbler's entire breeding range occurs on the Edwards Plateau and Lampasas Cut Plain of central Texas. Warblers are confirmed in 26 counties and may occur in another 12 counties. However, many of the counties where it is known to occur, now or in the past, have only small amounts of suitable habitat (Pulich 1976, Service 1996, Lasley et. al. 1997). For estimates of warbler habitat availability rangewide, see McKinney and Sansom 1995 and Diamond and True 2002.

Travis County contains the greatest amount of warbler habitat in large, contiguous blocks and lies at the center of the species' range (Service 1992). However, Bexar County also contains warbler habitat, but the only remaining large blocks are associated with Government Canyon State Natural Area and Camp Bullis. Other smaller areas in Bexar County that provide habitat include land owned and managed by the City of San Antonio Parks and Recreation Department, including Friedrich Wilderness Park, Crownridge, and Ironhorse.

Currently there are only four significant known warbler populations receiving some degree of protection: those at the Balcones Canyonlands Preserve (BCP) in Travis County, the nearby Balcones Canyonlands National Wildlife Refuge (BCNWR) in Travis, Burnet, and Williamson counties, the Fort Hood Military Reservation (Weinberg 1995) in Coryell and Bell counties, and Camp Bullis in Bexar County (proposed project area).

Reasons for Decline and Threats to Survival

Before 1990, the primary reason for warbler habitat loss was juniper clearing to improve conditions for livestock grazing. Since then, habitat loss has occurred as suburban developments spread into prime warbler habitat along the Balcones Escarpment. Warbler populations are limited primarily by the amount and configuration of available habitat. Pulich (1976) estimates that approximately 130,000 ac (52,608 ha) of potential habitat, or 35 percent, were lost from 1962-1990 and nesting territories have declined approximately 25 percent during that same period.

Activities that continue to threaten warblers include the clearing of deciduous oaks upon which the warblers forage, oak wilt, nest parasitism by brown headed cowbirds (Engels and Sexton 1994), drought, fire, stress associated with migration, and competition with other avian species (Ladd and Gass 1999).

Specifically, warblers are threatened by loss of habitat from urbanization. Human activities have eliminated habitat within the central and northern parts of their respective ranges, particularly areas associated with the Austin and San Antonio metropolitan areas. Populations of warbler and other neotropical migrants are less stable in small habitat patches surrounded by urbanization (Coldren 1998, Engels 1995, Arnold et al. 1996, Bolger et al. 1997, Moses 1996). Some studies indicate that the abundance of several bird species, including warblers, is reduced within 656-1640 feet (200-500 meters) of an urban edge (Engels 1995, Arnold et al. 1996, Bolger et al.

1997, Coldren 1998). Coldren (1998) reported that warbler occupancy declined with increasing residential development and roadway width.

Range-wide Survival and Recovery Needs

The recovery strategy outlined in the 1992 *Golden-cheeked Warbler Recovery Plan* (Warbler Recovery Plan) divides the breeding range of the warbler into eight regions, or units and calls for the protection of sufficient habitat to support at least one self-sustaining population in each unit. These recovery units were delineated based primarily on watershed, vegetational, and geologic boundaries (Service 1992).

Based on the Warbler Recovery Plan, protection and management of occupied habitat and minimization of further degradation, development, or environmental modification of unoccupied habitat are necessary to provide for the survival of the species. Habitat protection must include elements of both breeding and non-breeding habitat, i.e., associated uplands and migration corridors. Efforts to create new and protect existing habitat will enhance the warbler's ability to expand in distribution and numbers. Efforts to increase numbers of existing viable populations is critical to the survival and recovery of this species, particularly when rapidly expanding urbanization continues to result in the loss of prime breeding habitat.

Catastrophic fires within occupied habitats could result in the loss of significant portions of habitat and/or entire existing populations within each recovery unit. Efforts to control accidental fires should continue to be a priority to minimize the chance of significant loss of breeding warblers and the habitat necessary to allow for expansion of distribution and numbers of warblers.

In order to accurately assess the status of the warbler, formal surveys need to be conducted across its range in Central Texas. However, access to private lands to conduct formal surveys continues to be difficult to obtain. The *Golden-cheeked Warbler Population and Habitat Assessment Report* dated 1995 indicates that only a few counties (e.g., Bexar, Travis, Bell, Coryell) have been intensively studied in a manner that produces confident assessments. Currently, warblers are known to occur in 26 counties and may occur, however have not been confirmed to occur, in 12 more counties. Unconfirmed counties within the species' range require study.

Population viability assessments on warblers have indicated the most sensitive factors affecting their continued existence are population size per patch, fecundity (productivity or number of young per adult), and fledgling survival. It is estimated that a minimum of 32,500 ac (13,152 ha) of prime unfragmented habitat must be preserved to reduce the possibility of extinction in the next 100 years to less than five percent (Service 1995b). This acreage is estimated to provide the carrying capacity for 3,000 breeding pairs. Further, this minimum carrying capacity threshold estimate increases with poorer quality habitat, i.e., patchy habitat resulting from urbanization.

Black-capped vireo

Species Description and Life History

The black-capped vireo was Federally listed as endangered in 1987 (52 FR 37423). No critical habitat is designated for this species.

The vireo is a 4.5 inches (11.4 centimeters) long, insectivorous songbird. Mature males are olive green above and white below with faint greenish-yellow flanks. The crown and upper half of the head is black with a conspicuous white eye-ring. The iris is brownish-red and the bill is black. The mature females are generally duller in color than the males, and have a dark slate gray head (Service 1991).

Although vireo habitat throughout Texas is quite variable with respect to plant species, soils, and rainfall, habitat types generally have a similar overall appearance. Vireos typically inhabit patchy shrublands and open woodlands with a distinctive patchy structure. The shrub vegetation generally extends from the ground to about six feet (1.8 meters) above ground and covers about 30 to 60 percent of the total area. In the Edwards Plateau, common plants in vireo habitat include Texas oak, shin oak (*Q. sinuata*), live oak, mountain laurel (*Sophora secundiflora*), sumac (*Rhus*. sp), redbud (*Cercis canadensis* var. *texana*), Texas persimmon (*Diospyros texana*), mesquite (*Prosopis glandulosa*), and agarita (*Mahonia trifoliata*). Densities of Ashe juniper are usually low. In the Edwards Plateau, suitable habitat for the vireo is early successional scrub/shrub created by fire or woodland clearing. Vireos are opportunistic foragers, however, they prefer insect larvae and seeds (Grzybowski 1995).

Male vireos arrive in central Texas in late March and begin to establish breeding territories, which they defend against other males by singing within their territories. The females arrive a few days later, but are more difficult to detect in the dense brushy habitat. Three to four eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June. By mid-September, vireos begin their migration south, beginning with females and young and followed by adult males (Graber 1957, Oberholser 1974). Vireos breed from Oklahoma south through central Texas to the Edwards Plateau, then south and west to central Coahuila, Mexico and winter on the Pacific slope of Mexico.

Historic and Current Distribution

Vireo populations have been extirpated in Kansas, and have been reduced in Oklahoma, suggesting habitat loss and parasitism may be particularly prevalent in this part of the species' range (Grzybowski 1995).

The status of black-capped vireos is based on a lack of comprehensive surveys on the distribution and abundance of the vireo across the breeding range. Historically, access for surveys has been limited to managed land, road right-of-ways, and a few private landholdings. Very little documentation is available on the current status of the vireo on managed areas, with

the notable exception of The Nature Conservancy's annual reports on Fort Hood, reports on Camp Bullis, and reports from the Kerr Wildlife Management Area. This information is primarily available through personal communication with individual site managers.

Reasons for Decline and Threats to Survival

The vireo is threatened by some human activities. This species is also threatened by brown-headed cowbird parasitism in rural parts of its range.

Range-wide Survival and Recovery Needs

The Vireo Recovery Plan includes the criteria that there is a viable vireo population in each Texas region delineated by the Vireo Recovery Plan, and one each in Oklahoma and Mexico (Service 1991). The recovery strategy divides the breeding range of the vireo into four regions for Texas, or units, delineated based primarily on physiographic boundaries.

Based on the Vireo Recovery Plan, protection and management of occupied habitat and minimization of further degradation, development, or environmental modification of unoccupied habitat are necessary to provide for the survival of the species. Habitat protection must include elements of both breeding and non-breeding habitat, i.e., associated uplands and migration corridors. Efforts to create new and protect existing habitat will enhance the vireo's ability to expand in distribution and numbers. Efforts to increase numbers of existing viable populations are critical to the survival and recovery of this species, particularly when rapidly expanding urbanization continues to result in the loss of prime breeding habitat. Due to the nature of early successional shrub growth preferred by vireos, fire should be used to manage, enhance, and create vireo breeding habitat, as appropriate.

The *Black-capped Vireo Population and Habitat Viability Assessment Report* (Vireo PHVA) dated 1995 indicates that 13 counties in Texas containing potential habitat still require confirmation that vireos are present (Service 1995a). Currently, vireos are known to occur in 40 counties in Texas. Further, the Vireo PHVA estimated that a minimum fecundity of 1.20 female young per adult female to maintain long-term viable vireo populations. Cowbird control may be needed to achieve this goal and ensure survival and recovery of this species.

Endangered Cave Species (ECS)

Species Description and Life History

Madla's cave meshweaver*, R. exilis*, and *R. infernalis* were listed as endangered throughout their entire range on December 26, 2000, (65 FR 81419). Critical habitat was designated for these species on April 8, 2003, (68 FR 17155).

- The Madla's cave meshweaver is a small predatory long-legged cream colored spider with a body length between 0.177 to 0.256 inches (4.5 to 6.5 millimeters) that moves

rapidly when disturbed. It is usually found in the same caves as another species of the genus, *C. varians*. Adult *C. varians* are typically larger, darker, and more robust than the blind species. The various blind species of *Cicurina* can only be distinguished by detailed examination of the genitalia or by determining genetic composition.

Madla's cave meshweavers are usually found on the underside of rocks lightly buried in silt and typically build a small irregular web. Adults are rarely seen with males being extremely rare. It is likely that males mature, mate, and die soon afterwards. Juvenile specimens may be abundant under certain circumstances. This species may take more than a year to mature.

- *R. infernalis* is a reddish-brown beetle with minute eye rudiments and a narrow neck and a body length of about 0.256 to 0.315 inches (6.5 to 8 millimeters). This subspecies is the only member of the genus occurring locally. Other subspecies, however, frequently occur with *R. exilis*. The two species can be separated by the more robust body type of *R. infernalis*. A large-eyed species of *Rhadine* is also occasionally found in the same caves but usually occurs nearer the entrance and is much larger, darker, and more robust than the troglobitic (cave dwelling) species.

  This species may be occasionally abundant with ten or more individuals seen in a limited area. At some times, however, it is not apparent to human observation and rarely viewed.

- *R. exilis* are opportunistic feeders but have been most often seen eating dead or dying arthropods. Some species actively seek cave cricket eggs in caves.

These ECS are obligate (capable of surviving in only one environment) karst or cave-dwelling species of local distribution in karst terrain in Bexar County, Texas. ''Karst'' is a type of terrain in which the rock is dissolved by water so that much of the drainage occurs into the subsurface rather than as runoff. The subsurface drainage leads to passages or other openings within the underground rock formations.

Some of the features that develop in karst areas include cave openings, holes in rocks, cracks, fissures, and sinkholes. Habitat required by karst invertebrate species consists of underground, honeycomb limestone that maintains high humidity and stable temperatures. The surface environment of karst areas is also an integral part of the habitat needed by the animals inhabiting the underground areas. Openings to the surface allow energy and nutrients, in the form of leaf litter, surface insects, other animals, and animal droppings to enter the underground ecosystem. Mammal feces provide a medium for the growth of fungi and, subsequently, localized population blooms of several species of tiny, hopping insects. These insects reproduce rapidly on rich food sources and may become prey for some predatory cave invertebrates (Service 1994). While the life habits of the ECS are not well known, the species probably prey on the eggs, larvae, or adults of other cave invertebrates.

Historic and Current Distribution

Madla's cave meshweaver is known from six caves. One cave is within the Government Canyon karst region in Government Canyon State Natural Area, one is on Department of Defense (DOD) land, three are located in the Helotes karst region on private property, and one is located on private property in the University of Texas San Antonio (UTSA) karst region. Biologists have found *Cicurina vespera*, the vesper cave spider, in two caves. One cave is Government Canyon Bat Cave in the Government Canyon State Natural Area, and the other is a cave five miles (8.05 kilometers) northeast of Helotes. The location and name of this latter cave have not been revealed, but it is likely located on private property.

R. exilis is known from 35 caves in north and northwest Bexar County. Twenty-one are located on DOD land in the Stone Oak karst region. The remainder are distributed among the Helotes, UTSA, and Stone Oak karst regions, while one location lies in the Government Canyon region. One of the non-DOD sites is located in a county road right-of-way, one is located in a state-owned natural area, and the remainder are located on private property. Ongoing efforts by the DOD to locate and inventory karst features on Camp Bullis and to document the karst fauna communities in caves on Camp Bullis resulted in discovery of 18 of the 35 caves mentioned above (Veni 1994; James Reddell, University of Texas at Austin, pers. comm. 1997).

R. infernalis is known from 25 caves. This species occurs in five of the six karst regions: Helotes, UTSA, Stone Oak, Culebra Anticline, and Government Canyon. Scientists have delineated three subspecies (*R. infernalis ewersi, R. infernalis infernalis, R. infernalis ssp*.), and described and named two of these in scientific literature (Barr 1960, Barr and Lawrence 1960). In a recent report, scientists characterized the third subspecies as distinct, but not named (Reddell 1998). Only three caves, all on DOD land, contain the subspecies *R. infernalis ewersi*. Sixteen caves contain the subspecies *R. infernalis infernalis* and lie in the Government Canyon, Helotes, UTSA, and Stone Oak regions. Six caves in the Culebra Anticline region contain the unnamed subspecies.

Reasons for Decline and Threats to Survival

Threats to the species and their habitat include, but are not limited to: (1) destruction and/or deterioration of habitat by construction; (2) filling of caves and karst features and loss of permeable cover; (3) contamination from septic effluent, sewer leaks, run-off, pesticides, and other sources; (4) predation by and competition with nonnative fire ants; (5) factors that adversely affect their prey base; and, (6) vandalism to the karst habitat.

Range-wide Survival and Recovery Needs

The greatest threat to ECS is habitat destruction primarily from urbanization, cave vandalism, and filling in caves for safety purposes. Therefore, the greatest need for recovery of these species is the protection of remaining known occupied habitat or caves and their associated surface vegetation and surface and subsurface drainage areas for each species.

Environmental Baseline

Golden-cheeked warbler

Status within the Action Area

The Service considers the action area to include all habitat located within the jurisdictional boundaries of Camp Bullis.

Camp Bullis provides over 8,705.24 ac (3,522.89 ha) of warbler habitat. Of this, 3,780.08 ac (1,529.75 ha) are core habitat (is or has been occupied in the last three years), 4,925.16 ac (1,993.15 ha) are non-core habitat (has not been occupied in the last three years. Another 1,096.52 ac (443.75 ha) are currently unoccupied warbler habitat.

Warblers have been found in all areas of the Installation with suitable habitat. Based on surveys conducted the past 11 years, three sub-populations have been designated within the Installation due to the relatively high concentrations of warblers. These areas are: 1) Bullis Hills, 786 ac (318 ha); 2) Lewis Creek Valley, 1,075 ac (435 ha), and; 3) Cibolo Creek, 734 ac (297 ha). Warblers have also been observed in areas surrounding Camp Bullis, including Eisenhower Park to the south, and Friedrich Wilderness Park to the west.

According to the ESMP, estimated densities from point count surveys show an increasing trend for warbler populations from 1991 through 2002. Estimates of density from point counts on Camp Bullis should be considered as indices of density rather than absolute estimates of density. Mean estimated density from a sub-sample of 24 survey lines[1] (4-11 sample points per line) over 11 years (1991-2001) was 7.1 adult males per 247 acres (100 ha) with a range of 4.8 – 8.5 males per 247 acres (100 ha).

Estimates for Camp Bullis were lower than estimates derived from territory mapping of warblers on several study sites in the Austin area (range 4.5 –29.1 males per 247 acres (100 ha); Keddy-Hector *et al.* 1998) and from one study site on Fort Hood (range 13.5 – 28.1 males/247 acres (100 ha), 1992-96; Jette *et al.* 1998). However, point counts likely underestimate densities relative to estimates derived from territory mapping. The full 60-line sample was representative of all woodland habitats on Camp Bullis. The selection criteria likely account for the consistently higher estimates from the 24-line sub-sample compared to the full 60-line sample.

Monitoring of warbler territories on Camp Bullis was first conducted in 1998. Evidence of a pair was found on 14 of 22 territories (63.6 percent) monitored. Pairing success was comparable to observations at study sites near Austin (range 22 – 71 percent; Keddy-Hector *et al*. 1998) and below estimates of pairing success from one study site on Fort Hood (range 79 – 94 percent; Jette *et al*. 1998). Fledglings were detected on 11 territories (50 percent nest success). Nesting success in 1998 on Camp Bullis was slightly higher than nesting success observed at the Austin

[1] The 24-line sub-sample was subjectively selected as representing more optimal habitat areas for warblers on Camp Bullis (Stewardship Services 1995).

study sites (range 26 – 45 percent; Keddy-Hector *et al*. 1998) and below rates observed on the Fort Hood study site from 1992 through 1996 (range 78 – 90 percent; Jette *et al*. 1998).

The results of the 2002 survey indicate the continued population growth of warblers on Camp Bullis (Performance Group, Inc. 2002). Warbler density estimates indicated a 37 percent increase over the 2000 inventory and 200 percent over the 1998 survey. Several factors, both on and off Camp Bullis, could be contributing to this growth.

Factors affecting warblers within the Action Area

Surrounding pressures include developments around Camp Bullis that result in destruction of habitat and a reduction in the amount of available habitat. Possible factors on Camp Bullis include an increase in available habitat as younger vegetation matures and improved management actions. Adverse effects may include habitat disturbance or destruction from routine operations and live ammunition that may stray into warbler habitat and strike a warbler.

One previous warbler formal consultation has been completed for actions within Camp Bullis boundaries: Camp Bullis Deployable Medical Systems Equipment for Training where 0.34 ac (0.14 ha) of warbler habitat were cleared and 10 ac (4 ha) of warbler habitat were improved to offset effects of that action (Service File 94F-0115).

Two previous Service warbler consultations have involved lands near the action area: (1) Government Canyon - Housing and Urban Development land disposal of San Antonio Ranch in Bexar County resulting in take of 45.1 ac (18 ha) of warbler habitat (Service File 93F-170); and, (2) Canyon Springs Ranch – Mayberry Tract in Bexar County just north of the intersection of Hwy 281 and Stone Oak Pkwy resulting in two territories and 11.25 ac of habitat modified (surveys prior to construction identified 15 ac (6 ha) of suitable habitat and two pairs were detected) (Service File 97F-386).

Black-capped vireo

Status within the Action Area

The Service considers the action area to include all habitat located within the jurisdictional boundaries of Camp Bullis.

Little suitable vireo habitat occurs on Camp Bullis. Currently, Camp Bullis has an estimated 151.73 ac (61 ha) of vireo habitat, primarily located in MA 9 (132.4 acres(53.6 ha)), with 19.3 ac (7.8 ha) in MA 6A. Ashe juniper invasion and the fact that Camp Bullis is south-southeast of the main migration corridor likely contribute to the low numbers.

Vireo habitat requirements include low-growing patches of dense shrubs or trees separated by areas of open grassland as is produced in areas that are often burned or mowed. Distribution of vireos is patchy on Camp Bullis, and occurs primarily in the MA 9 impact area. Territories have

been documented over the years in MAs 4C, 5D, 5E, 6A, and 7. Vireos have also been observed in Friedrich Wilderness Park to the west of the Installation.

Vireo surveys from 1989 through 2002 identified an average of 11 different vireo territories on Camp Bullis per year (range = high 18, low 6). All known and potential vireo habitat is visited annually and checked for the presence/absence of vireos. Areas where vireos are detected receive repeat visits during the breeding season, when possible. Data recorded at each site visit are the presence of males, male/female pairs, nesting behavior, contents of nest, evidence of nest parasitism and number of fledglings. The survey window for this species is April 10th to July 15th. Weinberg (1999) summarizes status surveys and methods for vireos on Camp Bullis.

Vireo territories are predominantly found in the MA 9 live fire area on Camp Bullis where fires are more frequent. Based on annual surveys from 1989-2002, the annual Camp Bullis vireo population was found to range from six to 18 territories annually, with an average territory size of seven acres (2.8 ha). Variation among years is attributable in part to access limitations in the impact area (Weinberg 1999).

Systematic monitoring of vireo nesting attempts was conducted only in 1998. Mated pairs were detected on eight of 13 territories (62 percent). Four territories were known to successfully fledge vireo young. Two of four active nests were parasitized by brown-headed cowbirds, one of which fledged a cowbird. Interestingly, 23 nest starts that did not proceed to egg laying were located on seven territories. It should be noted that 1998 was a drought year with record high temperatures and may not reflect the normal reproductive potential of the vireo population on Camp Bullis.

Of the 129 total observations documented on Camp Bullis during 1989-2002, only ten to 15 percent were located in areas outside MA 9 Impact Area; only one of eight vireos documented in 2001 was observed outside MA 9. The history of occupation of sites outside the live fire area was also more variable relative to sites within the live fire area. Lack of habitat outside the Impact Area does not fully explain this distribution on Camp Bullis. In 1998, a comprehensive survey of 18 areas of potential vireo habitat outside of MA 9 areas was conducted on the Installation (Weinberg 1999). Of these, ten areas were subjectively judged as suitable for vireo occupancy.

Factors affecting vireos within the Action Area

Fires, whether prescribed or accidental, within vireo habitat appear to improve conditions for vireos because they reverse vegetative succession. Adverse effects may include habitat disturbance or destruction from routine operations and live fire that may stray into vireo habitat and strike a vireo.

One previous vireo consultation involved lands near the action area: Government Canyon – HUD land disposal of San Antonio Ranch in Bexar County resulting in take of 37 ac (15 ha) of vireo habitat (Service File 93-170).

Endangered Cave Species

Status within the Action Area

Surveys have been completed for all of the Installation and to date at least 1,100 karst features including 78 caves and 1,022 karst features have been documented on the Installation. Twenty-three (23) caves are known to contain Federally listed invertebrates; of these, 21 (or 1,890 ac (765 ha)) have been found to contain *R. exilis,* three (or 270 ac (109 ha)) contain *R. infernalis,* and one cave (or 90 ac (36 ha)) on Camp Bullis contains an endangered spider, Madla's cave meshweaver (*Cicurina madla)* (Veni and Elliott 1994; Veni, *et al.* 1995; Veni 1996,Veni and Assoc. 1998a; Veni and Assoc. 1998b; Veni, *et al.* 1999; Veni and Assoc. 2000; Veni and Assoc. 2002 a and b).

Factors affecting ECS within the Action Area

Adverse effects may include habitat disturbance or destruction from routine operations.

There has been one Service conservation planning effort in Bexar County: the LaContara Development Co. Habitat Conservation Plan (HCP) (TE-044512-0). Currently, efforts are underway to develop an HCP for the Edward's Aquifer, which occurs in Bexar County.

Effects of the Proposed Action

Proximity of the action – Projects that meet the criteria for inclusion in this consultation will be permitted under Camp Bullis project authorizations, as appropriate. Many authorizations will be issued for projects that will affect warbler, vireo, and/or ECS habitat. Projects may involve direct work in habitat, such as maneuver training, aviation training, live fire training, recreation, brush management, prescribed burning, grazing, surveying, monitoring, and operation and maintenance of the Installation. Other activities associated with the permitted project may occur adjacent to habitat and thus may affect upland warbler habitat that provides post-fledge foraging habitat. These activities may include grading, clearing, mowing, and equipment staging and access.

Distribution – Camp Bullis project authorizations are issued for projects that occur within the jurisdictional boundaries of Camp Bullis that occurs within the known range of warblers, vireos, and ECS.

Timing – Projects occurring outside of the nesting and post-fledging periods for warblers and vireos minimize and avoid most adverse effects to warblers and vireos. However, mission critical activities that are authorized by Camp Bullis occur year round and there is very little flexibility to alter timing of activities due to the urgency of the overall mission of Camp Bullis. To the greatest extent practicable, those projects that occur in warbler or vireo habitat should be implemented outside of the nesting and post-fledging season.

Establishment of nesting territories by, and post-fledging activity of, warblers and vireos generally occurs March to August. Warblers and vireos generally fledge in late April to mid-May and spend the rest of the summer foraging in upland and/or riparian habitats. Initial nesting success and successful foraging through the nesting and post-fledging period is critical to reproductive success for both species. Disturbance during this time may lessen reproductive success.

Disturbance duration and frequency – Projects that would qualify for this programmatic opinion may have both temporary and permanent effects. Projects may be completed within one season, or may require two or more seasons to complete. Some projects may result in permanent loss of habitat and an increased disturbance frequency associated with maintenance and recreation activities. Temporary loss of habitat and temporary disturbance may result from repairs, modifications, or maintenance (e.g., temporary fill for a construction access, maneuver training, etc.). Increased disturbance frequency from recreation, traffic, or human intrusion may be an indirect effect of some projects. Completed projects that require routine maintenance activities in proximity to habitat have future potential to cause harm, harassment, or injury.

Disturbance intensity and severity – Projects that would qualify for this consultation have either small permanent or temporary effects, as described in Table 1, that can be restored at completion of the project. Projects qualifying under this opinion are expected to have only small effects on listed species populations.

Direct effects – Projects that may remove vegetation or create erosive conditions could result in direct effects to listed species. Because ECS utilize caves, they may be buried, or otherwise injured, from activities that result in any fill entering a cave. Silting, fill, or spill of oil or other chemicals could cause loss of prey items for ECS. Although the risk is very slight due to the topography of live fire areas, warblers may be inadvertently hit by live rounds that exceed the boundaries of the live fire areas. Any disturbance may also cause warblers and vireos to move into areas of unsuitable habitat where they will experience greater risk of predation or other sources of mortality.

Indirect effects – Utility lines, road improvements, drainage facility improvements, and recreational structures, may all potentially increase use of areas not previously used and may have indirect effects to listed species, specifically from human intrusion during routine maintenance operations. Activities that create noise such as aviation training and live fire from large rounds could also indirectly effect warblers and vireos.

Beneficial effects. The programmatic process will expedite projects resulting in adverse effects to listed species habitat and may encourage Camp Bullis to avoid greater effects, that would require a lengthy permit process. Project planning efforts that stay within the programmatic opinion guidelines may facilitate listed species recovery by resulting in significantly less habitat loss, and possibly the creation of more habitat over time. Occupied habitat currently protected will provide population components that are not threatened by the factors that contributed to

listing the species. The Service anticipates that the conservation measures implemented now will secure protected habitat areas distributed across Camp Bullis.

Cumulative Effects

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

An undetermined number of future land use conversions and routine agricultural practices are not subject to federal authorization or funding and may alter the habitat or increase incidental take of warblers, vireos, and ECS, and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) unpredictable fluctuations in habitat due to urbanization; (2) increase in impervious cover due to urbanization and the installation of appurtenant facilities, i.e., roads, etc.; (3) use of pesticides on listed species habitat; (4) contaminated runoff from agriculture and urbanization; (5) nest parasitism; and, (6) predation by feral animals and pets.

Camp Bullis is an island of green within an ever more urbanized landscape. The area around Camp Bullis is quickly being developed and habitat for listed species continues to be converted to other uses. It is theorized that much of the increase in densities of warblers on Camp Bullis over the past five years has been due to habitat loss immediately surrounding the Installation (Jackie Schlatter, Camp Bullis, pers. comm. 2005).

The Edwards recharge zone is fast being converted from a rural landscape to an urban one and from pervious to impervious cover. This both decreases recharge of the aquifer and seals the karst features occupied by ECS. Camp Bullis' commitment to karst management will provide protection for a number of caves and other features known to contain endangered species. Close scrutiny of Army training actions and land management procedures will protect the majority of features on the Installation, regardless of the presence of sensitive species. Though the Karst Management Plan may have some localized detrimental effects from collections, overall the plan will ensure the long-term survival of these species and continued recharge of the aquifer.

Other than three Parks (Government Canyon State Natural Area, Guadalupe River State Park and Friedrich Wilderness Park) there is continued conversion of warbler habitat to urban uses around Camp Bullis. As with the Karst Management Plan, the Camp Bullis ESMP may have some short-term detrimental effects from surveys, but the overall effect will be positive. In addition, the plan will serve to minimize or avoid those detrimental effects from Army training and land management activities. To date, the upward trend of the population indicates success. Barring large-scale habitat destruction from accidental fires, Camp Bullis will continue as significant space for the warbler in this part of the range.

Although a relatively small amount of vireo habitat exists on Camp Bullis, the ESMP will provide for long term protection of vireos by sustaining existing populations and encouraging population growth on Camp Bullis.

Though it is not possible to determine changes in Army training loads in the near future because of uncertainties in current overseas operations, the Army is committed to conserving and protecting all five species occurring on Camp Bullis. There is no significant change in training anticipated that would require the conversion of warbler habitat to grassland. There are no significant changes in training anticipated that would require fewer protections to karst ecosystems or that will require the conversion of vireo habitat to other uses.

Conclusion

After reviewing the current status of the warbler, vireo, and ECS, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the projects that meet the qualifications for this programmatic opinion, and will be evaluated for cumulative take and habitat losses annually, are not likely to jeopardize the continued existence of the golden-cheeked warbler, black-capped vireo, and ECS. No critical habitat occurs within the project area for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined by the Service as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding and sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, and sheltering. Incidental take is defined by the Service as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are nondiscretionary and must be implemented by Camp Bullis so that they become binding conditions of any authorization issued to implement a project covered by this programmatic opinion, as appropriate, in order for the exemption in section 7(o) (2) to apply. Camp Bullis has a continuing duty to regulate the activity covered by this incidental take statement. If Camp Bullis (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the authorizations, and/or (2) fails to retain

oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates incidental take of warblers, vireos, and ECS will occur as a result of the proposed project. The project sizes and effects authorized under this programmatic opinion will vary, but are expected to have small effects. ECS are secretive and inhabit areas difficult to monitor or survey. Individual warblers, vireos, and ECS are difficult to detect unless they are observed, undisturbed, in their environment. Most close-range observations of warblers and vireos represent chance encounters that are difficult to predict. The Service anticipates the following amount of incidental take from maneuver training, aviation training, live fire training, recreation, brush management, prescribed burning, grazing, surveying, monitoring, and operation and maintenance of the Installation:

1. No more than one (1) ac (0.40 ha) per year of golden-cheeked warbler habitat may be permanently lost and no more than four (4) ac (1.62 ha) per year of golden-cheeked warbler habitat may be temporarily adversely affected;

2. No more than one-half (0.5) ac (0.20 ha) per year of black-capped vireo habitat may be permanently lost and no more than one-half (0.5) ac (0.20 ha) per year of black-capped vireo habitat may be temporarily adversely affected;

3. The number of golden-cheeked warblers that may be found within five (5) ac (2.0 ha) of habitat per year may be disturbed, harassed, harmed, or killed as a result of actions permitted under this opinion; and,

4. The number of black-capped vireos that may be found within one (1) ac (0.40 ha) of habitat per year may be disturbed, harassed, harmed, or killed as a result of actions permitted under this opinion.

Camp Bullis contracts qualified permitted professionals for scientific collection and monitoring purposes for ECS. Each professional contracted by Camp Bullis is currently authorized for take by their individual section 10(a)1(A) permits. No other take is discussed in this programmatic opinion for ECS because none is anticipated to occur from the proposed actions.

Effect of the Take

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the golden-cheeked warbler, black-capped vireo, or ECS. No critical habitat occurs within the jurisdictional boundaries of Camp Bullis, therefore, none will be affected.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of golden-cheeked warblers and black-capped vireos:

1. Minimize harassment and harm of golden-cheeked warblers or black-capped vireos during activities associated with implementing the projects; and,

2. Minimize effects of temporary losses and degradation of habitat of golden-cheeked warblers and black-capped vireos and, to the greatest extent practicable, minimization shall include habitat restoration to pre-project conditions.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Camp Bullis must comply with the following terms and conditions, that implement the reasonable and prudent measures described above and outline required reporting/monitoring requirement. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure number one:

    A. To the greatest extent practicable, authorized activities within golden-cheeked warbler or black-capped vireo habitat should be conducted between August 15th and February 28th. This is the non-nesting period for golden-cheeked warblers and black-capped vireos and potential adverse effects are minimized and avoided;

    B. To the greatest extent practicable, authorized activities within core golden-cheeked warbler habitat and adjacent riparian areas or within known nesting territories of black-capped vireos should be minimized during the nesting and post-fledging season (March 1st to August 14th);

    C. All personnel involved in any authorized activity covered by this programmatic opinion shall be informed of the terms and conditions of this biological opinion prior to the implementation of the authorized activity;

    D. Golden-cheeked warblers or black-capped vireos encountered during authorized activities should be allowed to move away from activities on their own. Capture and relocation of trapped or injured individuals can only be attempted by personnel or individuals with current Service recovery permits pursuant to section 10(a)1(A) of the Act;

E. To the greatest extent practicable, movement of heavy equipment to and from a project site shall be restricted to established roadways to minimize habitat disturbance; and,

F. Black-capped vireo and golden-cheeked warbler surveys shall be conducted annually to facilitate routine operation planning efforts to avoid and minimize adverse effects caused by routine operations.

2. The following terms and conditions implement reasonable and prudent measure number two:

A. Known occupied habitat of federally-listed species shall be designated as Environmentally Sensitive Areas and personnel shall, to the greatest extent practicable, avoid such areas;

B. After completion of activities covered by this programmatic opinion that result in habitat alteration, any temporary fill, construction, or other debris shall be removed and, wherever feasible, disturbed areas shall be restored to pre-project conditions; and,

C. Camp Bullis shall ensure compliance with the Reporting Requirements below to assist in management decisions to avoid and minimize effects on golden-cheeked warblers, black-capped vireos, and their associated habitats.

Reporting Requirements

Appropriate Camp Bullis personnel shall notify the Service immediately if golden-cheeked warblers or black-capped vireos are found on site as detailed in term and condition 1D, and will submit a report including date(s), location(s), habitat description, and any voluntary corrective measures taken to protect each bird found. Appropriate personnel shall submit locality information to the TPWD no more than 90 calendar days after completing the last field visit of the project site. Each form shall have an accompanying scale map of the site such as a photocopy of a portion of the appropriate 7.5 minute U.S. Geological Survey map and shall provide at least the following information: name of the quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) encountered; and a description of the habitat by community-vegetation type.

Where temporary or permanent adverse effects occur, a post-activity report shall be forwarded to the Supervisor, Austin Ecological Services Field Office, within 60 calendar days of the completion of such activities. This report shall detail (1) dates that activity occurred; (2) pertinent information concerning the success in implementing restoration measures; (3) an explanation of failure to meet such measures, if any; (4) known project effects on federally listed species, if any; (5) occurrences of incidental take of federally listed species, if any; and (6) other pertinent information.

The Austin Ecological Services Field Office is to be notified within three working days of the finding of any dead listed species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Field Supervisor at (512) 490-0057.

Review Requirements

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than 40 ac (16 ha) of golden-cheeked warbler habitat will be temporarily affected and no more than ten ac (four ha) of golden-cheeked warbler habitat will be permanently lost for the duration authorized under this opinion, or a total of ten years.

With implementation of this measure, the Service believes that no more than five acres (two ha) of black-capped vireo habitat will be temporarily affected and no more than five acres (two ha) of black-capped vireo habitat will be permanently lost for the duration authorized under this opinion, or a total of ten years.

In addition, (1) the number of golden-cheeked warblers that may be found within five ac (two ha) of habitat per year may be disturbed, harassed, harmed, or killed as a result of actions permitted under this opinion and, (2) the number of black-capped vireos that may be found within one ac (0.40 ha) of habitat per year may be disturbed, harassed, harmed, or killed as a result of actions permitted under this opinion. If, during the course of the authorized activities, this minimized level of incidental take is exceeded prior to the annual review, such incidental take represents new information requiring review of the reasonable and prudent measures provided. Camp Bullis must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures. This programmatic opinion will expire ten years from the date of issuance of this programmatic opinion. Issuance of a new programmatic opinion will be subject to evaluation of the recovery of the species.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibilities for these species.

1. Camp Bullis should assist the Service in the development and implementation of recovery plans for each listed species;

2. Camp Bullis should incorporate into bidding documents the terms and conditions of this programmatic opinion, when appropriate; and,

3. Camp Bullis, in partnership with the Service, should develop maintenance guidelines for Camp Bullis projects that will reduce adverse effects of routine maintenance on listed species and their habitat. Such actions may contribute to the delisting and recovery of listed species by preventing degradation of existing habitat and increasing the amount and stability of suitable habitat.

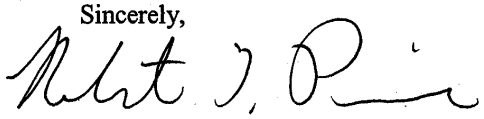
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Reinitiation Notice

This concludes formal consultation on the implementation of the Military Mission and Associated Land Management Practices and Endangered Species Management Plan (ESMP) for the U.S. Army's Camp Bullis in Bexar County, Texas. As provided in 50 CFR Sec. 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion; or, (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact Allison Arnold at (512) 490-0057, extension 242.

Sincerely,



Robert T. Pine
Supervisor

cc:
Jackie R. Schlatter, Camp Bullis, San Antonio, TX

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